TEPP LLC TRANSPORTATION ENGINEERING, PLANNING AND POLICY

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

MEMORANDUM

Ref: 1691

Subject: Traffic Assessment Supplement
Proposed Bridle Path Village Residential Development
Marshfield, Massachusetts

From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
keh@teppllc.com

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INTRODUCTION

TEPP LLC has prepared this traffic-assessment memorandum (TAM) supplement regarding the proposed Bridle Path Village residential development in the Town of Marshfield, Massachusetts. TEPP LLC previously prepared the November 29, 2016 TAM.

This TAM supplement concludes that:

- relevant available sight distances at the Ferry Street/proposed driveway intersection are adequate
- calculated trip generation is below relevant thresholds for preparing a traffic-impact and access study
- the combination of appropriate street facilities and the very low number of anticipated truckloads indicate no significant impact on safety, levels of service, or queuing

PROPOSED DEVELOPMENT

The development program provides 56 multifamily dwelling units.

SIGHT DISTANCES

This TAM presents sight distances for the Ferry Street/proposed driveway intersection.

The American Association of State Highway and Transportation Officials (AASHTO) has established authoritative policy for sight distances at unsignalized intersections in terms of:

- stopping sight distance (SSD)
- optional intersection sight distance (ISD)[1]

SSD: [2]

- provides for safety
- enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road
- is conservative because it encompasses a wide range of brake-reaction times and deceleration rates

Optional ISD:[3]

- is ordinarily greater than SSD and may enhance traffic operations
- is not required for safety

Table 1 shows relevant available sight distances that are adequate.

Table 1. Sight distances.

Intersection and View	Available Sight Distance (ft)[a]	Provides SSD for Speed (mph)	Provides ISD for Speed (mph)
Ferry Street/Proposed Driveway			
Ferry Street to/from North	825±	50+	50+
Ferry Street to/from South	525±	50+	47+

[a] Provided by Grady Consulting, L.L.C. With appropriate roadside and vegetation maintenance.

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative reference *Trip Generation Manual*.[4] This information is based on empirical data for a

[1] AASHTO, *A Policy on Geometric Design of Highways and Streets*, 7th Edition (Washington, DC, 2018), pages 9-35 to 9-36.

[2] AASHTO, pages 3-2 to 3-6.

[3] AASHTO, pages 9-35 to 9-59.

[4] ITE, *Trip Generation Manual*, 11th Edition (Washington DC, September 2021).

variety of land uses including multifamily housing (low-rise), land use 220, based on dwelling units.[5]

Table 2 shows calculated weekday vehicle-trip generation for the site as:

Table 2. Trip generation

Weekday Vehicle-Trips[a]						
	AM-Street-Peak Hour			PM-Street-Peak Hour		
Daily	Total	In	Out	Total	In	Out
256	40	10	30	45	28	17

[a] Based on ITE, *Trip Generation Manual*, land use 220, multifamily housing (low-rise), 56 dwelling units.

- daily, 256 (total of in and out)
- AM-street-peak hour, 40 (10 in and 30 out)
- PM-street-peak hour, 45 (28 in and 17 out)

POTENTIAL TRAFFIC IMPACTS

ITE suggests that land developments generating at least 100 peak-hour vehicle-trips, in the busier direction, are candidates for consideration of traffic-impact analysis.[6] The calculations show less than 100 peak-hour vehicle-trips, in the busier direction, due to the proposed development.

The Town Zoning Bylaws Section 11.10 states "A detailed traffic impact analysis shall be submitted . . . for a development . . . which would have an anticipated average peak hour trip generation in excess of 80 vehicle trip ends or an average weekday generation in excess of 800 vehicle trip ends; except that the requirement for traffic impact analysis may be waived . . .." [7] The calculations show lower trip generation than these thresholds.

MATERIAL-REMOVAL DURATION

The project will remove about 150,000 cubic yards (cy) of material from the site. About 40 truckloads per day, at about 26 cy per truckload, yields about 1,040 cy removed per day. About

[5] ITE, *Trip Generation Manual*, volume 3, pages 252 to 272.

[6] ITE, *Manual of Transportation Engineering Studies* (Prentice Hall: Englewood Cliffs, New Jersey, 2000), page 144.

[7] Town of Marshfield, Massachusetts, Zoning Bylaws, amended through October 24, 2016.

250 working days per year yields about 260,000 cy removed per year. This indicates that the project can remove 150,000 cy within one year.

MATERIAL-REMOVAL DISTRIBUTION

Three material-removal routes are anticipated:

- along Clay Pit Road
- Clay Pit Road, to left turn to Ferry Street, to right turn to Furnace Street, to right turn to Route 3A
- Clay Pit Road, to left turn to Ferry Street, to right turn to Furnace Street, to right turn to Route 139, which connects to Route 3

Table 3 shows the anticipated material-removal distribution.

Table 3. Material-removal distribution.

	Total	Along Clay Pit Road	Route 3A North	Route 139 and Route 3
Daily CY[a]	1,040	520 (50%)	234 (22.5%)	286 (27.5%)
Truckloads per Day	40[b]	20	9	11
Truckloads per Hour	5[c]	2 to 3	1 to 2	1 to 2

[a] Based on anticipated operations.

[b] Based on 26 cy per truckload.

[c] Average per hour given operations for eight hours per day, 7:00 AM to 3:00 PM.

All three material-removal routes appropriately provide for large trucks, including the Furnace Street intersections with Ferry Street, Route 3A and Route 139, which includes medians, turn lanes, signs and/or signalization. Furnace Street also includes crossing guards near the school area. The combination of appropriate street facilities and the very low number of anticipated truckloads indicate no significant impact on safety, levels of service, or queuing.

CONCLUSION

In conclusion:

- relevant available sight distances at the Ferry Street/proposed driveway intersection are adequate
- calculated trip generation is below relevant thresholds for preparing a traffic-impact and access study
- the combination of appropriate street facilities and the very low number of anticipated truckloads indicate no significant impact on safety, levels of service, or queuing